

Interchangeable Parts

Americans take for granted that when they purchase a light bulb or replacement oil filter, those parts will fit where they are supposed to fit. These mass-produced items are interchangeable. All the rotating tubs produced for a specific brand of washing machine will be identical to work in any washing machine of the same model.

This was not always the case. Each of George Washington's soldiers in the American Revolution carried a musket an individual gunsmith made. Although most weapons looked alike, their parts could not be used in other muskets. For example, a trigger spring from one musket could not be used in another because it would not be the correct size and shape. Each part of the musket had been made and fitted for only one musket.

In 1778 a French engineer, Honore Blanc, began experimenting with making muskets from mass-produced, identical parts. He convinced the government to buy his weapons because he could take ten muskets apart, dump the pieces into a box, and then draw out the pieces at random to re-assemble them. This meant the price of producing or repairing even complex machines would decrease.

Eli Whitney, the inventor of the cotton gin, performed the same demonstration in 1798 to secure a contract to produce 10,000 weapons for the United States Army. The officials watching this demonstration did not know, however, that Whitney had only produced rough parts with a machine, and then he employed gunsmiths to spend dozens of hours filing them down by hand to be identical. He had not solved the problem of machine-producing interchangeable parts.

Eli Terry of Connecticut did produce "pillar and scroll" clocks in 1814 with true interchangeable parts. However, Terry's clocks were built almost entirely of wooden parts. Mass production of interchangeable metal parts had not been mastered. By 1832 Simeon North and John Hall had solved the problem. They manufactured rifles by first stamping out roughly similar parts, then having a milling machine cut them down almost identically before gunsmiths used files to finish any rough edges.

Interchangeable parts would change the American economy radically. Goods became cheaper, but the need for specialized craftsmen such as gunsmiths, shoe-

Activities: Guided Readings/Secondary

makers, or dress-makers declined. Workers did not need as much training to run a machine that merely stamped out parts according to a master pattern.

Name: _____

Date: _____

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Discussion Questions:

1. These craftsmen produced individual rifles and muskets.
 - a. coopers
 - b. cobblers
 - c. gunsmiths
 - d. armory masters

2. He conducted the first demonstration of weapons produced with interchangeable parts.
 - a. Honore Blanc
 - b. Gustavus Adolphus
 - c. Henry Colt
 - d. Simeon North

3. He manufactured the first mass-produced clocks with interchangeable parts.
 - a. Eli Whitney in 1798
 - b. Simeon North in 1832
 - c. Honore Blanc in 1778
 - d. Eli Terry in 1814

4. By the 1830s interchangeable metal parts were first stamped out by machine, and finally finished by craftsmen filing them down. In between, they were cut to very nearly the same size by
 - a. water wheels
 - b. milling machines
 - c. clockwork drills
 - d. gunsmiths